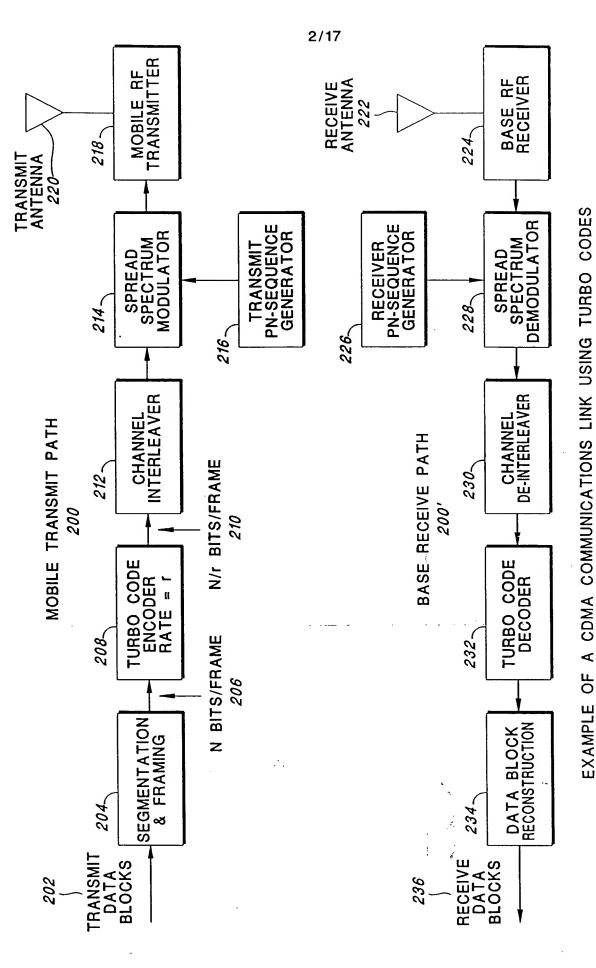
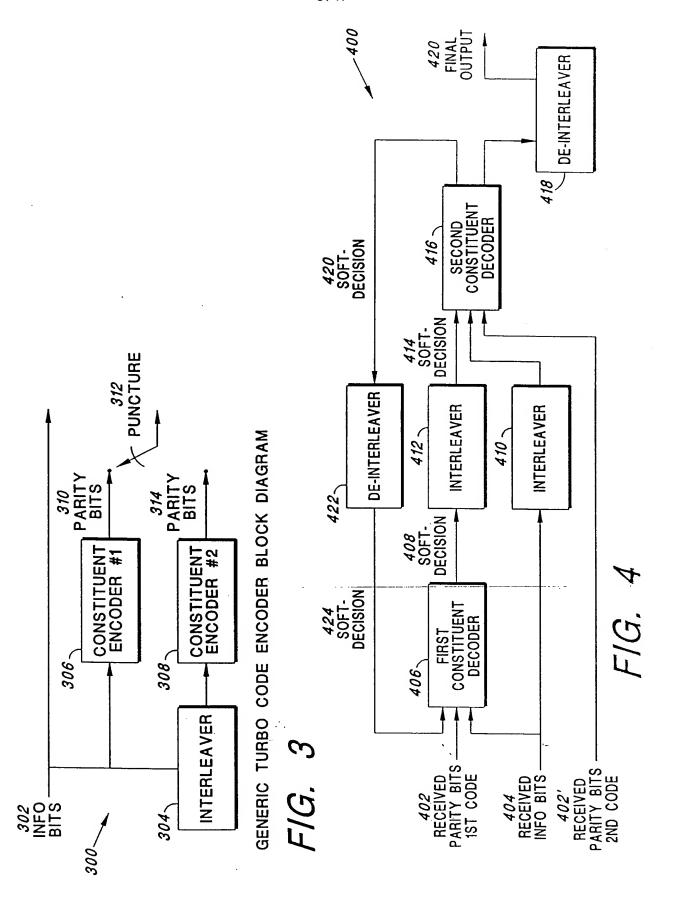


F/G. 1



A CDMA COMMUNICATIONS LINK USING TURBO CODES S P



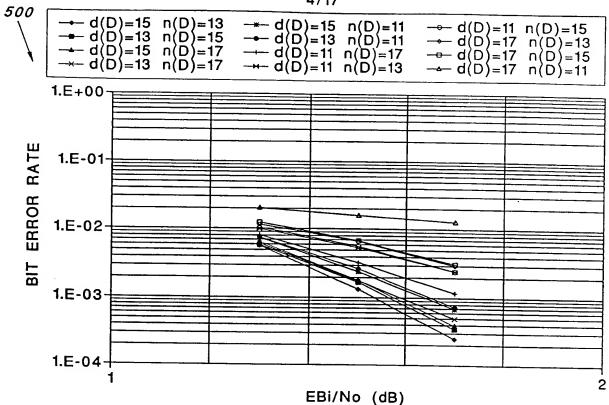


FIG. 5 RATE-1/2 TURBO CODES ON AWGN CHANNEL. (1000 BIT INTERLEAVER, 3 ITERATIONS)

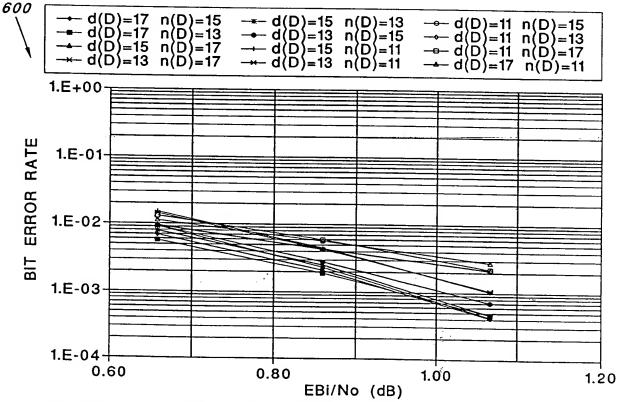


FIG. 6 RATE-1/3 TURBO CODES ON AWGN CHANNEL. (1000 BIT INTERLEAVER, 3 ITERATIONS)

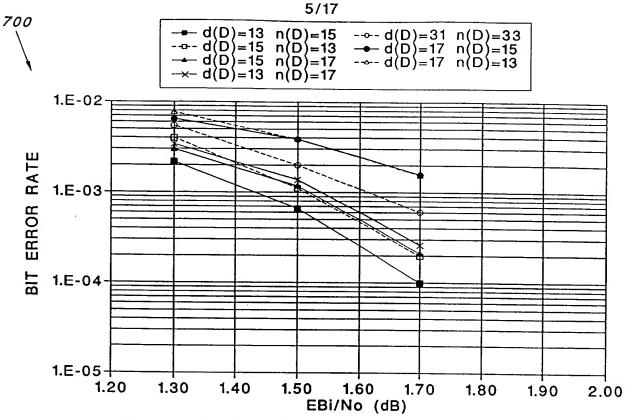


FIG. 7 SELECTED RATE 1/2 TURBO CODES ON AWGN CHANNEL, 512 BIT FRAME SIZE

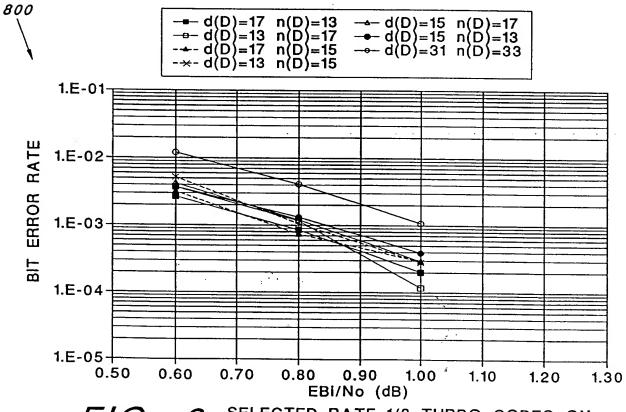


FIG. 8 SELECTED RATE 1/3 TURBO CODES ON AWGN CHANNEL, 512 BIT FRAME SIZE

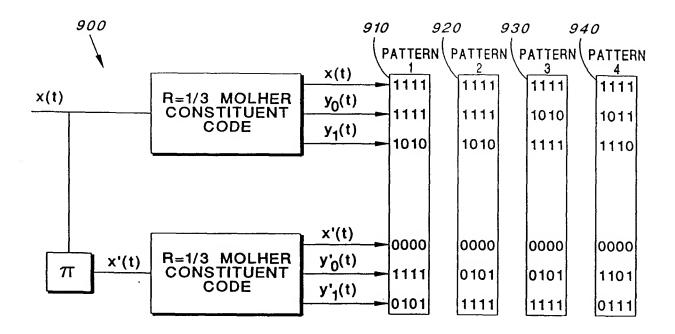
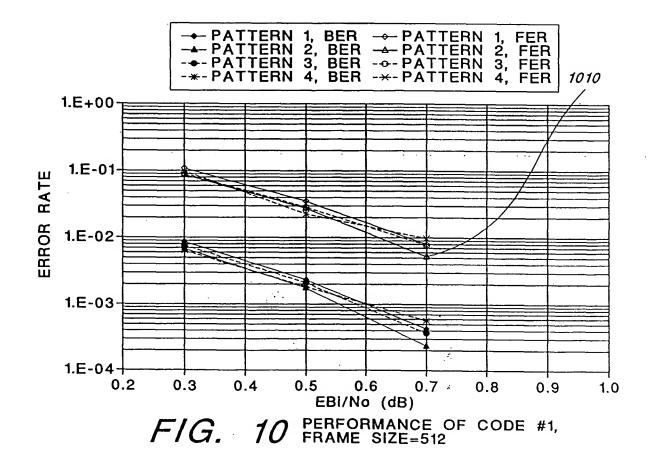
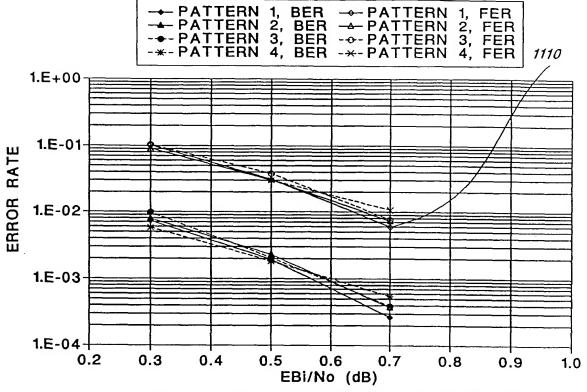


FIG. 9 PUNCTURING SCHEMES STUDIED FOR OPTIMIZING THE RATE 1/4 TURBO CODE







F/G. 11 PERFORMANCE OF CODE #2, FRAME SIZE=512

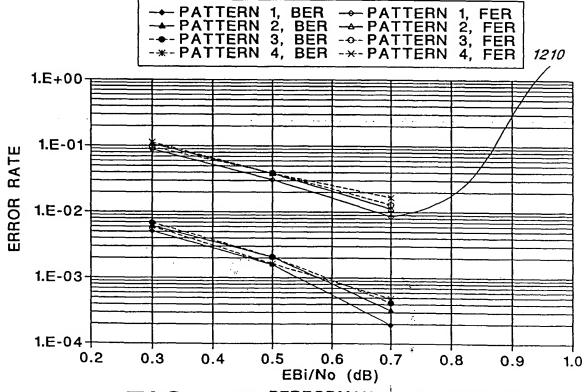


FIG. 12 PERFORMANCE OF CODE #3, FRAME SIZE=512

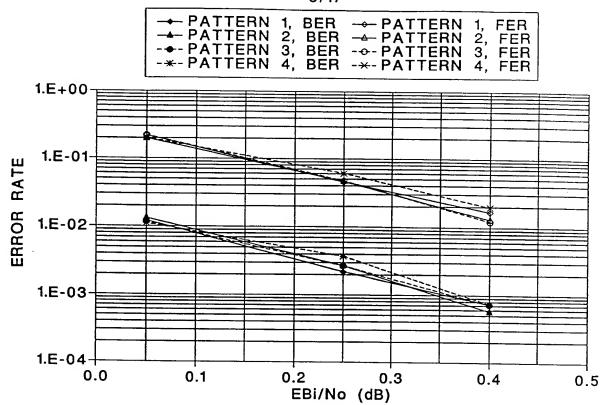


FIG. 13 BER/FER PERFORMANCE OF CODE #1, FRAME SIZE=1024

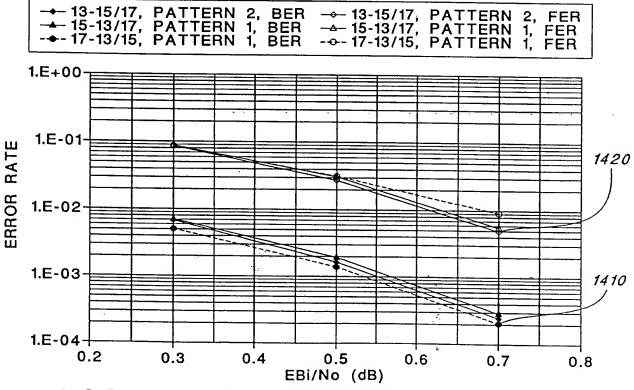


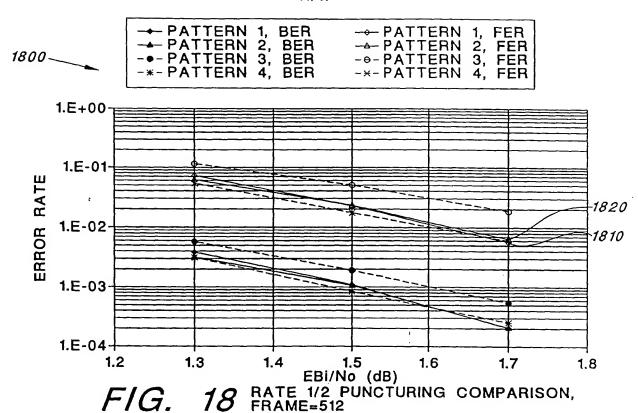
FIG. 14 BER/FER PERFORMANCE OF SELECTED RATE-1/4 TURBO CODES, FRAME SIZE=512

```
- 13-15/17,
                                           → 13-15/17,
                 PATTERN
                                                          PATTERN
                                                                      5,
                                                                         FER
       13-15/17,
                 PATTERN
                              6, BER
                                           <del>-</del>4- 13-15/17,
                                                          PATTERN
                                                                      6,
                                                                         FER
      15-13/17,
15-13/17,
                 PATTERN
                                           -e- 15-13/17,
                              5, BER
                                                          PATTERN
                                                                         FER
                 PATTERN
                              6, BER
                                           ~×- 15-13/17,
                                                          PATTERN
   -- 17-13/15, PATTERN 5,
-- 17-13/15, PATTERN 6,
                              5, BER
                                           -<del>□- 17-</del>13/15, PATTERN
                                                                      5,
                                BER
                                           → 17-13/15, PATTERN
                                                                      6, FER
    Recommended Turbo Code (code B): BER
                                           -x- Recommended Turbo Code (code B): FER
       1.E+00
1500_
        1.E-01-
   ERROR RATE
       1.E-02
       1.E-03-
       1.E-04-
             0.2
                        0.3
                                  0.4
                                             0.5
                                                        0.6
                                                                  0.7
                                                                             8.0
                                        EBi/No (dB)
                                 COMPARISON AGAINST OTHER PUNCTURING SCHEMES, FRAME=512
             FIG.
                   PATTERN
                                  BER
                                              ← PATTERN
                                                               FER
                   PATTERN
                               2,
                                            - PATTERN
- e - PATTERN
                                  BER
                                                            2, FER
3, FER
1700-
                   PATTERN
                               3,
                   PATTERN
                               4,
                                  BER
                                             -×- PATTERN
                                                            4, FER
                                                            5,
                   PATTERN
                                            ---- PATTERN
                               5,
                                  BER
                                                               FER
FER
                  - PATTERN
                               6,
7,
                                  BER
                                            -M- PATTERN
                                                            6,
                  - PATTERN
                                  BER
                                             -X-PATTERN
    1.E+00-
     1.E-01-
ERROR RATE
                                                                             -1720
    1.E-02
                                                                             -1710
    1.E-03
    1.E-04-
          0.4
                  0.5
                          0.6
                                  0.7
                                          0.8
                                                  0.9
                                                          1.0
                                                                   1.1
                                                                          1.2
                                     EBi/No (dB)
                              COMPARISON OF RATE 1/3
                              PUNCTURING SCHEMES, FRAME=512
```

0091	`		0/0/		1618		
	1614 PATTERN 7	1111-1620	1110~1624	0 0 0 0 1626	0 0 0 1-1628	1110-1630	
	PATTERN 6		0 0 0 1	0000	1110	0001	
	PATTERN 5		0000	0 0 0 0	0 0 0 0	1111	TE = 1/3
	1608 PATTERN 4		0 0 0 0	0 0 0 0	0001	1111	a) TURBO CODE RATE = 1/3
	<u>1606</u> PATTERN 3	1 1 1 1	0 1 0 1 0 1	0 0 0 0	1010	0 1 0 1	(a) TURB
	1604 PATTERN 2	1 1 1 1	1111	0 0 0 0	0000	1111	<i>.</i> `.
	1602 PATTERN 1		0 0 0 0	0 0 0 0	1111	0000	

1646	PATTERN 4	1111	1010	0000	0 0	0 0 0 0	10	1/2
1644	PATTERN 3	1111	1000	0 0 1 0	0 0	0001	•	RATE =
1642	PATTERN 2	1111	0000	1010	0 0	0	0101	TURBO CODE
1640	PATTERN 1	1111	1010	0000	0 0 0 0	0 1 0 1	0000	(q)

F/G. 16 ESSENTIAL PUNCTURING PATTERNS FOR RATE 1/3 COSTITUENT CODES



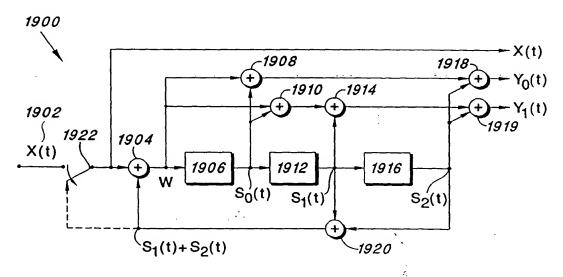


FIG. 19 UNIVERSAL CONSTITUENT ENCODER RECOMMENDED FOR FORWARD LINK TURBO CODES OF VARYING INTERLEAVER DEPTH

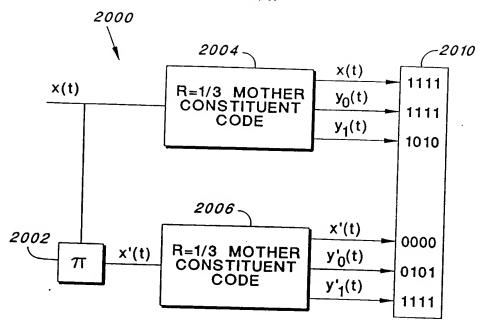


FIG. 20 FORWARD LINK TURBO CODE OF RATE 1/4 (MOTHER CODE IN FIGURE 19)

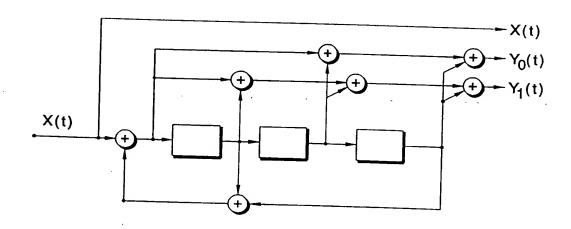


FIG. 25 CONSTITUENT ENCODER FOR REVERSE-LINK TURBO CODE

PATTERN	1 PATTERN 2	PATTERN 1	PATTERN 2
111	111111	1111	11111111
111	111110	1101	11011010
000	000000	0000	00000000
000	000000	0000	00000000
110	110111	1010	10101101
000	000000	0000	00000000
FOR RAT	IRING PATTERNS TE 3/8 FORWARD NK CODES	FOR RATE	G PATTERNS 4/9 FORWARD CODES

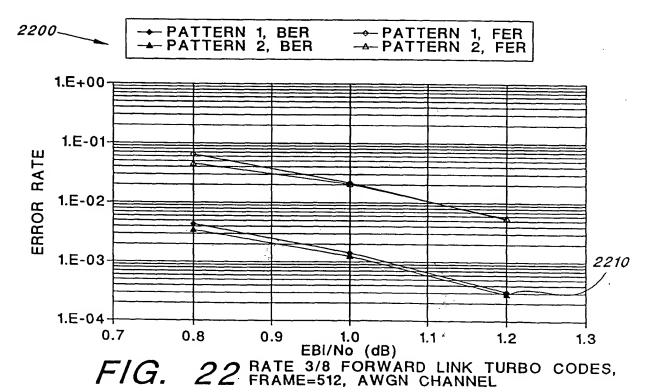
FIG. 21

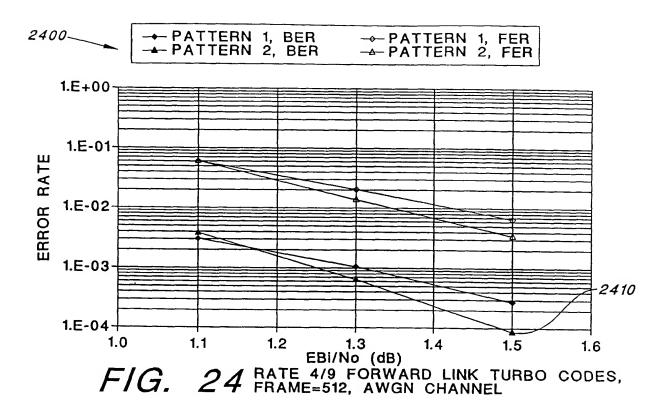
FIG. 23

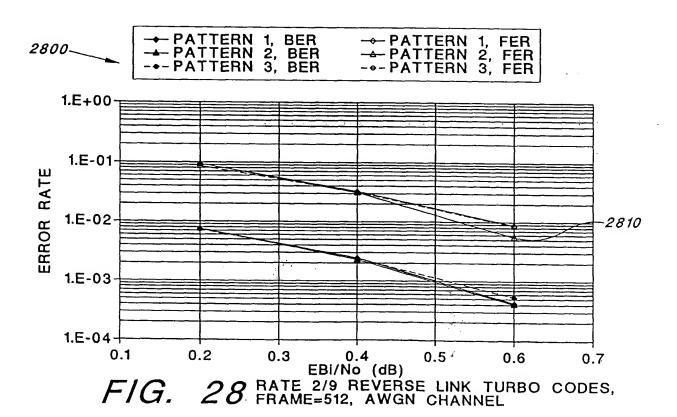
PATTERN 1	PATTERN 2	PATTERN 3
1111	1111	1111
1111	1011	1111
1011	1111	1011
0000	0000	0000
1111	1110	1110
1110	1111	1111

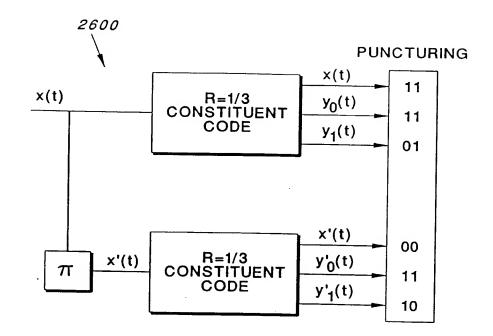
PUNCTURING PATTERNS FOR RATE 2/9 REVERSE LINK CODES

FIG. 27









F/G. 26 REVERSE LINK TURBO CODE OF RATE 1/4 (MOTHER CODE IN FIGURE 25)

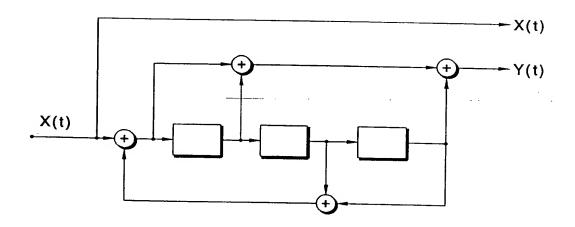
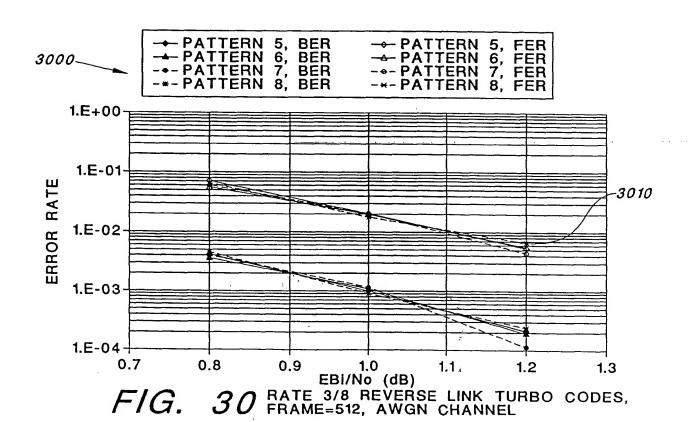


FIG. 31 UNIVERSAL CONSTITUENT ENCODER RECOMMENDED FOR R=1/2 AND R=1/3 TURBO CODES OF VARYING INTERLEAVER DEPTH

	16/17	
PATTERN 1	PATTERN 2	PATTERN 3
111 111 000	111 110 001	111 110 001
000 110 000	000 110 000	000 010 100
PATTERN 4	PATTERN 5	PATTERN 6
111 100 011	111 100 011	111 000 111
	• • •	

INITIAL PUNCTURING PATTERNS FOR RATE 3/8 REVERSE LINK CODES

FIG. 29



3200 \

→ 15-13/17, PATTERN 1, BER → 15-13/17, PATTERN 1, FER → g1(D)=463, g2(D)=535, g3(D)=733, g4(D)=745, BER → g1(D)=463, g2(D)=535, g3(D)=733, g4(D)=745, FER

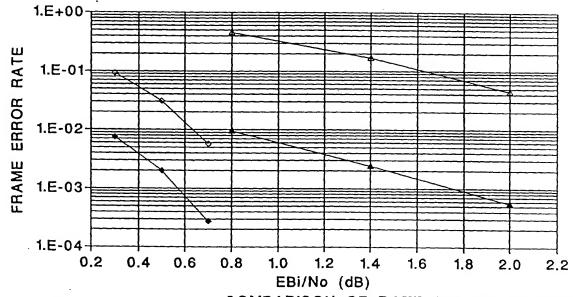


FIG. 32

COMPARISON OF RATE 1/4 FER-OPTIMIZED TURBO CODE VS CONVOLUTIONAL CODE, FRAME SIZE=512